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Art Unit: 1624

Examiner: Tucker, Z. C.

For: PROCESS FOR DRYING PHENOXYMETHYLBENZOIC ACIDS

Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

Sir:

This appeal is from the examiner's rejection of August 22, 2002.

REAL PARTY IN INTEREST

The real party in interest is BASF Aktiengesellschaft of Ludwigshafen, Germany.

Reel 011693, Frame 0706, recorded on March 20, 2001.

RELATED APPEALS AND INTERFERENCES

To appellants' knowledge and belief, there are no interferences or other appeals which will directly affect or be directly affected by or have a bearing on the Board's decision in this application.

STATUS OF CLAIMS

Claims 1-4 remain in the application. Claim 3 is allowed, and claims 1, 2, and 4 stand rejected under 35 USC §103(a) as being unpatentable over Wingert et al. (US 5,221,762).

STATUS OF AMENDMENTS

No amendment after the last rejection has been filed.

SUMMARY OF INVENTION

The present claims are drawn to a process for drying water- and/or solvent-wet phenoxymethylbenzoic acids at a temperature in the range of from 1° to 25°C above their melting point under the drying conditions employed.

ISSUES

Whether claims 1, 2, and 4 are obvious under 35 USC § 103(a) from the disclosure of Wingert et al. (US 5,221,762).

GROUPING OF CLAIMS

The claims have not been argued separately, and will not be argued separately here.

ARGUMENTS

The following legal authorities are relied on in the following arguments in the order in which they are cited:

In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)

In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992)

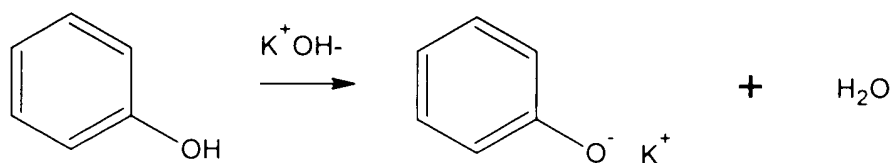
In re Merck & Co., Inc., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986)

In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)

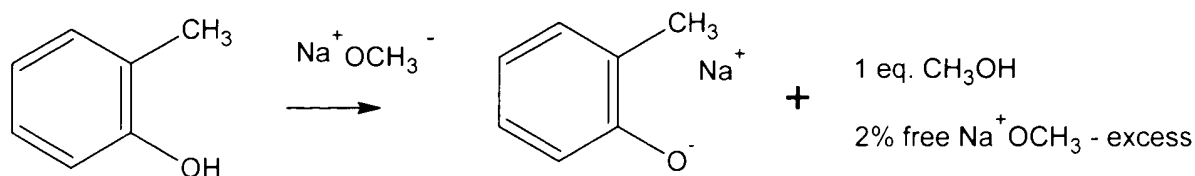
THE WINGERT PROCESS

Wingert et al. (US 5,221,762) disclose a process for producing e-oxime ethers of phenylglyoxylic esters (col.1:5-22). This process entails, in relevant part, production of a 2-phenoxyethylbenzoic acid intermediate which is further processed to produce the ultimate end product (col.1:38-5:32). The examiner asserts that solvent is vaporized, necessarily, through heating of phenoxyethylbenzoic acid precursors in this intermediate process of Wingert (ppr.4,p.4). However, as applicants have set forward earlier, and as a close reading of the Wingert reference discloses, the benzoic acid is produced only *after* the reaction mixture is cooled. The heated mixture in Wingert consists only of the benzoate *base* and its phenolate and lactone precursors.

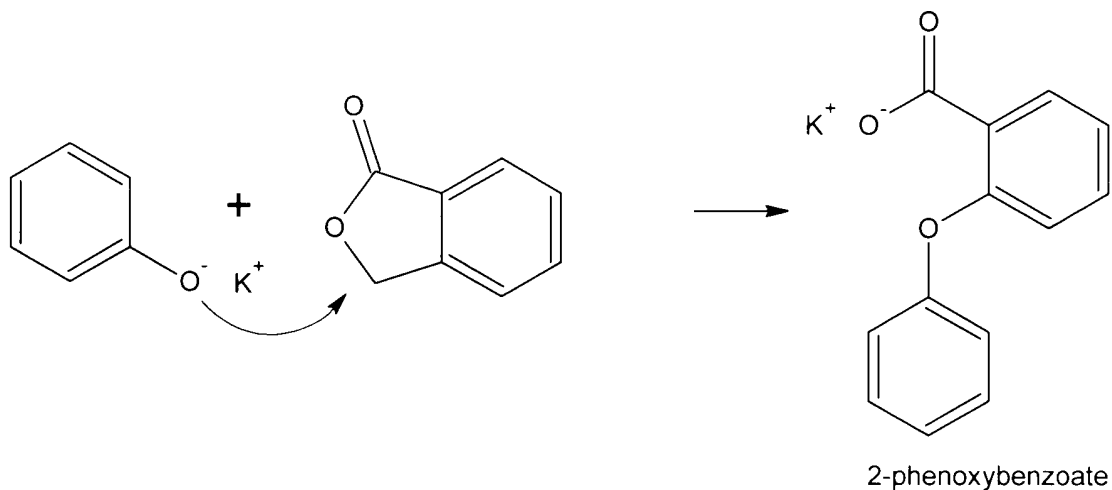
The Wingert process begins with conversion of a phenol to its corresponding phenolate through the addition of a base, referred to as step a) (col.1:41-50;col.11:56-65). In example 1, this step is performed through mixture of 1.6 mol phenol with the equivalent of 1.6 mol KOH as aqueous potassium hydroxide in xylene (col.7:62-65). Similarly, example 3 shows mixture of 2.08 mol o-cresol with 2.12 mol sodium methylate in methanol (col.15:47-50). In example 1 the base is equimolar with the phenol, and in example 3, the base is present in 2% excess. The reaction diagram of example 1, step a) would be as follows



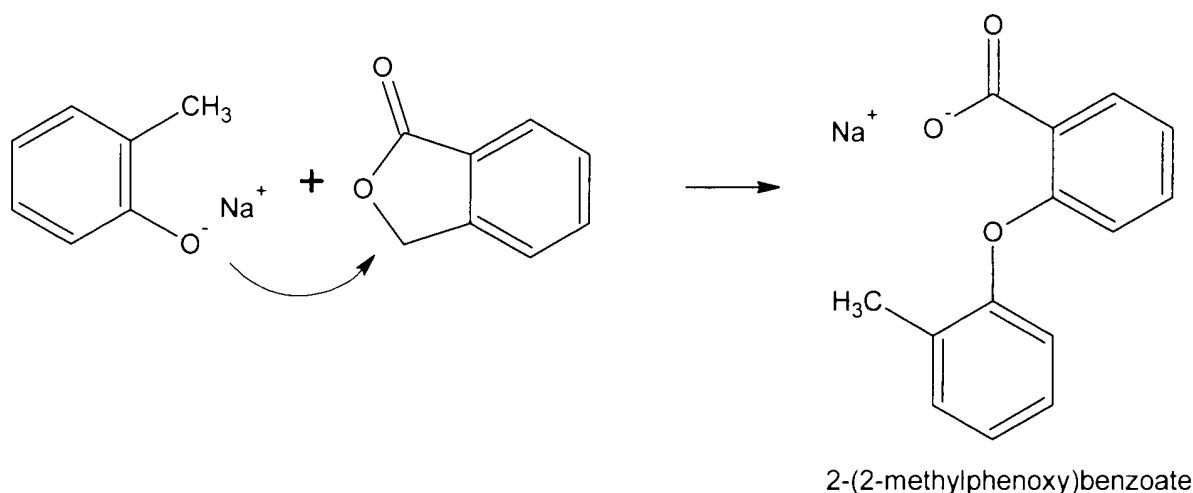
and that of example 3, step a) would be



In the second step, b), of this intermediate process, a lactone, phthalide in both examples, is introduced into the reaction mixture (col.1:51-63;col.11:66-col.12:9). These begin to react according to the following mechanisms and produce 2-phenoxybenzoate and 2-(2-methylphenoxy)benzoate as end products. The mechanism of example 1, step b) is



and that of example 3, step b) is



Each of these products is *still a base*.

The third step of this intermediate process continues this reaction, and involves

- c) removing the diluent by distillation and reacting the molten mixture at from 50° to 250°C.

(col.1:64-65;col.12:10-11.) Example 1 indicates that the reaction mixture was stirred at 100°C for 15 hours, and example 3 indicates that methanol was removed by distillation, after which "the resulting melt was heated to 200°C" and stirred for one hour (col.7:68-col.8:1;col.15:53-55). It is in this step that the examiner asserts drying of the benzoic acid to take place. However, no chemicals are added in this step, and the examiner has not indicated by what alternate process the benzoate becomes acidified at this point.

In the fourth and final step of the intermediate process, the melt is dissolved in water and acidified (col.1:66-68;col.12:12-13). As indicated in example 1, "[a]fter cooling to 20-25°C, the product mixture was extracted twice" and acidified through

addition of aqueous hydrochloric acid (col.8:1-4, emphasis supplied). In example 3, "[t]he solution obtained *after* cooling was extracted twice ... and then diluted. The aqueous phase was acidified with concentrated sulfuric acid to pH 2" (col.15:56-60, emphasis supplied).

It is evident in the reference that heating the mixture of phenolate and lactone is for purposes of reacting these to produce the benzoate product, rather than to drive any diluent off the benzoic acid product. As indicated above, step c) involves "removing the diluent ... and *reacting the molten mixture [of phenolate and lactone]* at from 50° to 250°C" (col.12:10-11, emphasis supplied). Heating of this mixture drives the reaction which produces the phenoxybenzoate, rather than driving off solvent, further evident in that "[t]o stop the reaction, the melt is diluted" (col.12:53). Dilution of the melt in each example occurs after mixture of the basic phenolate with the lactone and prior to any acidification of the resulting product.

As stated by Wingert, after dilution with water, "[t]he resulting solution is acidified *to liberate the 2-phenoxyethylbenzoic acid*" (col.12:54-56, emphasis supplied). This is step d) of the intermediate process, and Wingert discloses no heating steps corresponding or in parallel with this step. The heating of step c) occurs prior to acidification, when benzoate is present and benzoic acid is not. Wingert states that once the benzoic acid solution is obtained, "workup is by conventional means" to isolate the compound (col.12:58). It is *this* conventional post-production workup, rather than the heating in step c) of the intermediate process, to which the present invention is

directed. Wingert makes no further discussion of this post-production processing.

OBVIOUSNESS UNDER 35 USC §103(A)

To establish *prima facie* obviousness, an examiner must show in the prior art a teaching or suggestion of each claim element, some suggestion or motivation to make the claimed invention, and a reasonable expectation for success in doing so (see, e.g., *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986); *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)). These requirements have not been met.

As indicated above, Wingert discloses a process for producing phenoxybenzoic acids, wherein a phenol is treated with base, a lactone is added to the resulting phenolate, the mixture is then heated, cooled, diluted, and acidified. The phenoxybenzoic acid thus produced is then worked-up by conventional means and used for further production.

Wingert does not suggest or teach a processing step for working-up phenoxybenzoic acid in the manner presently claimed. The present claims require that water- and/or solvent-wet phenoxymethylbenzoic acids be heated to a temperature of from 1° to 25°C above their melting point. Wingert does not suggest this. The heating step at root of the examiner's argument involves phenoxymethylbenzoate and its precursors. Only after the resulting benzoate melt is cooled and acidified is

phenoxyethylbenzoic acid present. Wingert makes no suggestions or teachings concerning the further processing of this product. Accordingly the present claims cannot be obvious over the Wingert reference.

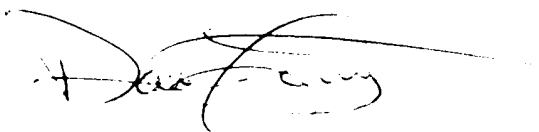
CONCLUSION

In view of the foregoing remarks, applicants consider that the rejections of record have been obviated and respectfully solicit passage of the application to issue.

Please charge any shortage in fees due in connection with the filing of this paper, including Extension of Time fees to Deposit Account No. 11-0345. Please credit any excess fees to such deposit account.

Respectfully submitted,

KEIL & WEINKAUF

A handwritten signature in dark ink, appearing to read 'David C. Liechty', is written over a horizontal line.

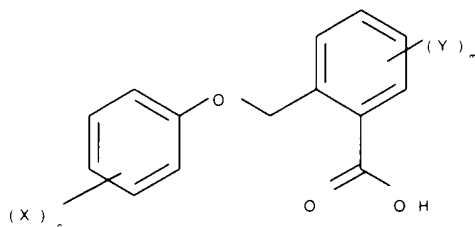
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APPENDIX

1. A process for drying phenoxyethylbenzoic acids of the general formula I



where X, Y, m and n have the following meanings:

X and Y are, independently, a halogen or a C-organic radical,

m has a value from 0 to 4 and

n has a value from 0 to 5

which comprises drying the water- and/or solvent-wet phenoxyethylbenzoic acids at a temperature in the range from 1° to 25°C above their melting point under the drying conditions employed.

2. A process as claimed in claim 1, wherein the drying is carried out at temperatures in the range from 130° to 240°C under atmospheric pressure.
3. A process as claimed in claim 1, wherein solvent residues are partly removed by washing with water before drying.
4. A process as claimed in claim 1, wherein a phenoxyethylbenzoic acid with a water and/or solvent content of from 0.1 to 50% by weight is employed.